

Atty Docket No. JCLA6897-R

Serial No. 10/091,945

REMARKS**Present Status of Application**

Claims 1, 7-8, 10, 13 and 14 remain pending in the application. The Office Action mailed December 14, 2004, rejected claims 1, 7-8, 10, 13 and 14 under U.S.C. 103(a) as being unpatentable over Karnezos (US Patent No. 6,020,637) in view of Sherman (US Patent No. 5,784,262).

Claims 1 and 10 have been amended, while claims 7-8 and 13-14 have been cancelled. Applicant believes that these changes do not introduce new matter and reconsideration of those claims is respectfully requested. In view of the above amendments and the following discussions, a notice of allowance is respectfully solicited.

Discussion for 35 U.S.C. 103 rejections

Claims 1, 7-8, 10, 13 and 14 were rejected under U.S.C. 103(a) as being unpatentable over Karnezos (US Patent No. 6,020,637) in view of Sherman (US Patent No. 5,784,262).

Claims 1 and 10 have been amended to provide more detailed descriptions according to the present invention respectively. Supporting grounds for these amendments can be found in at least claims 8 and 14, figure 5 and the related descriptions in page 8 of the specification. From figure 5 of this invention, it clearly shows that the conductive material 372 filling the via 370 overlaps onto the surface 353 of the ground wiring 352.

As amended, independent claims 1 and 10 respectively recite:

Claim 1. A cavity down ball grid array packaging structure, comprising:

Atty Docket No. JCLA6897-R

Serial No. 10/091,945

a heat spreader;

a ground substrate bonded onto the heat spreader without any sandwiched layer except adhesive material, the ground substrate having an opening exposing the heat spreader;

a substrate bonded to the ground substrate, wherein the substrate comprises at least an insulating layer, a patterned wiring layer, and a via formed through the insulating layer and the patterned wiring layer and electrically connected to the ground substrate, and the patterned wiring layer comprises at least a ball pad, a first contact pad, and a first ground pad spaced apart from and electrically connected to the via, wherein the first ground pad is electrically connected to the via through a ground conductive wiring, and a conductive material filled in the via overlays with a portion of the ground conductive wiring;

a chip having an active surface and a corresponding back surface, the chip bonded into the opening of the ground substrate and onto the heat spreader via the back surface thereof, the chip including at least a second contact pad and a second ground pad, the second contact pad and the second ground pad positioned on the active surface of the chip;

a first conductive wire connecting the first contact pad with the second contact pad;

a second conductive wire connecting the second ground pad with the ground substrate;

an encapsulant material encapsulating the chip, the first and second conductive wires; and

a plurality of solder balls attached to the ball pad and the first ground pad but apart from the via.

Claim 10. A cavity down ball grid array packaging carrier, suitable for use in a chip packaging structure, the cavity down ball grid array carrier comprising:

a heat spreader;

a ground substrate bonded onto the heat spreader without any sandwiched layer except adhesive material, the ground substrate having an opening exposing the heat spreader; and

a substrate bonded to the ground substrate, wherein the substrate comprises at least an insulating layer, a patterned wiring layer, and a via formed through the insulating layer and the patterned wiring layer and electrically connected to the ground substrate, and the patterned wiring layer comprises at least a ball pad, a contact pad, and a ground pad spaced apart from and electrically connected to the via, wherein the first ground pad is electrically connected to the via through a ground conductive wiring, and a conductive material filled in the via overlays with a portion of the ground conductive wiring.

Applicant respectfully asserts that the structure of the amended claims 1 or the structure of amended claim 10 is patentably distinct from the prior art reference. Especially, the structure comprises at least a substrate bonded to the ground substrate, wherein the substrate comprises at least an insulating layer, a patterned wiring layer, and a via formed through the insulating layer and the patterned wiring layer and electrically connected to the ground substrate, and the patterned wiring layer comprises at least a ball pad, a contact pad, and a ground pad spaced apart from and electrically connected to the via, wherein the first ground pad is electrically connected to the via

Atty Docket No. JCLA6897-R

Serial No. 10/091,945

through a ground conductive wiring, and a conductive material filled in the via overlays with a portion of the ground conductive wiring.

Karnazos merely discloses a package structure including a heat spreader 110, a ground plane 160 and an interconnect substrate 150. The interconnect substrate has a plurality of metal patterns 118 and vias 119 defined through the interconnect substrate. Solder balls 120 are disposed directly on the vias 119, as shown in Fig. 4.

As noted by the Office Action, Karnazos does not disclose the first ground pad spaced apart from the via. Obviously, Karnazos also fails to teach the ground conductive wiring for connecting the first ground pad and the via, and a conductive material filled in the via overlaying with a portion of the ground conductive wiring.

The Office Action relied on Sherman for teaching pads spaced from vias.

Sherman simply teaches pad-throughhole arrangements by arranging the via 22 connecting to the via pads 26 on the side of the mounting pads 18. However, Sherman fails to teach or suggest a conductive material filled in the via overlaying with a portion of the ground conductive wiring and therefore can not completely remedy the deficiencies of the reference Karnazos.

Because all the cited references fail to teach, suggest or disclose each and every feature of the present invention, and therefore they cannot possibly arrive at the claimed invention, as suggested by the Office Action. Accordingly, Applicants respectfully submits that independent claims 1 and 10 patently define over the prior art references, and should be allowed. Therefore, reconsideration and withdrawal of these 103 rejections are respectfully requested.

Atty Docket No. JCLA6897-R

Serial No. 10/091,945

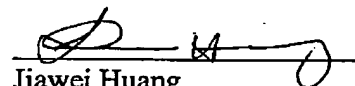
CONCLUSION

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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